

SECTION 03100 – CONCRETE FORMWORK

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This section includes furnishing materials and installation of concrete formwork as indicated on the Drawings and/or specified herein.
- B. Related Work: The following items of related work are specified in other sections.
 - 1. Section 03200: Concrete Reinforcement
 - 2. Section 03300: Cast – In – Place Concrete
- C. Work Included: This Section of these specifications includes only the fabrications and erection of the concrete formwork for the cast-In-Place Concrete – of these Specifications; all requirements of Part 1 – General – Section 03300 govern all materials and work specified in this Sections.
- D. General: Formwork shall comply with ACI standards publication 347.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Design and Construction: Forms shall conform to the types, shapes, lines, and grades shown on the Drawings. Forms shall be securely tied braced in position, and shored to support safely all construction loads, sufficiently tight to prevent appreciable leakage of mortar and be clean of all debris at time of concreting. Responsibility for adequacy and safety shall be the Contractor's responsibility but design shall be subject to approval.
- B. Form ties shall be such type that when forms are removed, no metal shall be left within 1 – 1/2 inch of any surface.
- C. Smooth surface forms shall be used for all exposed surfaces and shall consist of the following:
 - 1. Concrete Exterior Form Plywood, resin overlay face on fir plywood backup 5-veneer plies, 5/8" thick by 4' x 8' sheet size, factory oiled and edges sealed.
 - 2. Use plywood boards, except as noted, for all exterior exposed concrete. Minimize all joints between sheets, and prevent any bulging or pillowing of large sheets by back-up lumber at open spaces with a maximum distance between supports of 8".
 - 3. Forms for exposed concrete must be treated as finished woodwork or cabinetwork. Surface material shall be laid out in as large as practicable and shall be laid out in regular and symmetrical pattern as approved. Edges of units shall be tight-butted together with clean, straight joints; any appreciable space at joints shall be filled. Maximum variation in alignment of surfaces at a joint shall be 1/16". There shall be no bulges or defects higher or lower respectively than 3/16" in four feet.

4. Unfinished surface forms may be used for all unexposed surfaces, such as surfaces to be in contact with earth, in unfinished spaces, areas to receive finishes, and such other locations as indicated on the Drawings. For these surfaces, wood NO 2 Common or Better lumber, metal or other type of forms shall be used for all surfaces that are to be plastered.
5. Temporary openings shall be provided at the base of wall forms and at other necessary points to facilitate cleaning and inspection before concreting.
6. The contact face of forms shall be coated with non staining mineral oil or other approved coating or in the case of wood forms may be thoroughly wetted (except in freezing weather). Oil coatings shall be applied and excess wiped off before placing reinforcement. Release agent shall be of a type that will not affect the rubbing, sealing or painting of the exposed concrete surface.
7. Side forms for footings may be omitted with the approval of the Engineer where soil conditions are suitable.
8. Forms and form lumber may be reused if in good condition after being cleaned and reconditioned, if approved.
9. Corners of exposed concrete should have $\frac{3}{4}$ " chamfers unless shown otherwise.

D. Lightweight forming material

1. Lightweight forming material, Expanded Polystyrene (EPS) Board, shall conform to the requirement of ASTM Standard C-578. The EPS material shall have a minimum density of 1.25 lbs/cu ft. and a maximum density of 20 lbs/cu. ft. EPS boards shall be manufactured by PERMA "R" Products, Inc. of Grenada, MS or approved equal.
2. Lightweight forming materials shall be designed to be left in place after the pouring of concrete as a permanent fixture of the structure.

E. All exposed corners or edges of columns, piers, walls, etc. shall be framed with a $\frac{3}{4}$ inch chamfer, unless shown or noted otherwise on the plans.

PART 3 – EXECUTION

3.01 INSPECTION

- A. The Owner's Representative shall be notified when the concrete is ready for inspection. The formwork and/or excavation shall have the approval of the Owner's Representative before placing of the concrete.

3.02 PREPARATION

- A. Surface material shall be laid out in as large units as practicable and shall be laid out in regular and symmetrical pattern as approved. Edges of units shall be tight-butted together with straight, clean joints: any appreciable space at joints to be $\frac{1}{16}$ ". There shall be no bulges or defects deeper or higher respectively than $\frac{3}{16}$ " in four feet.

3.03 INSTALLATION OF EMBEDDED ITEMS

- A. Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by cast-in-place concrete. Use settings

drawings, diagrams, instructions and directions provided by suppliers of the items to be attached thereto.

- B. Edge Forms and Screed Strips for Slabs: set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in the finished slab surface. Provide and secure units to support types of screeds required.

3.04 REMOVAL OF FORMS

- A. Formwork not supporting concrete, such as sides of walls, columns, and similar parts of the Work, may be removed after cumulatively curing at not less than 10^o C (50^o F) for 24 hours after placing concrete, provided concrete is sufficiently hard and not be damaged by form removal operation, and provided that curing and protection operations are maintained.
- B. Reshores shall be placed as soon as practicable after stripping operations are complete but in no case later than practicable after stripping operations are complete and in no case later than the end of the day on which stripping occurs. Reshores shall be tightened to carry their required loads without overstressing the construction. Reshores shall remain in place until tests representative of the concrete being supported have reached the specified strength, and heavy loads due to construction operations have been removed.
- C. Form facing material may be removed four days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

END OF SECTION